ANNUAL REPORT
TO
OFFICE OF NAVAL RESEARCH

DoD Science and Engineering Apprenticeship Program for High School Students

1995–'96 Activities
Contract No. N00014-91-J-1825

Principal Manager: Dr. Richard L. Pfeffer
Geophysical Fluid Dynamics Institute
The Florida State University
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June 1996
The Florida State University
Tallahassee, Florida

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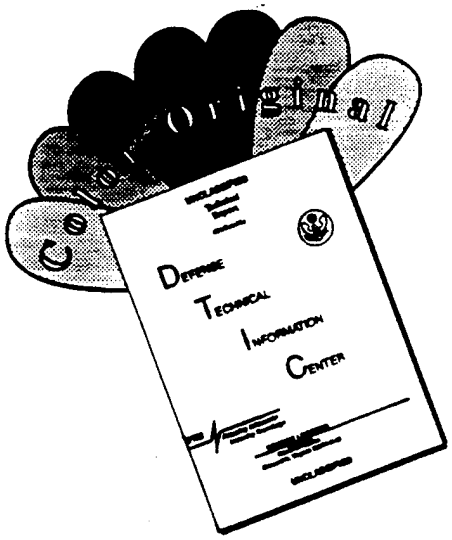

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1. INTRODUCTION

The year 1995–'96 represented our fourteenth successful DoD Science and Engineering Apprenticeship Program for High School Students at Florida State University, sponsored by the Office of Naval Research. The program this year was again administered by the Geophysical Fluid Dynamics Institute (GFDI) under the direction of Dr. Richard L. Pfeffer. Student educational activities and work experiences were centered at GFDI.

In the spring of 1995 the guidance counselors of five local high schools were asked to recommend outstanding college-bound students who they thought would benefit most from our program. Eight students were selected to participate starting in the summer of 1995 and nine during the school year, five of whom were from the summer program and 2 of whom were from last year's program. Our student group consisted of four seniors, six juniors and two exceptional sophomores. The departure from our past concentration on seniors was motivated by our desire to expose students to science and scientific methodology at an earlier age. Some background information concerning the students who were selected appears in the following section. Further information pertaining to each apprentice is attached at the end of the report.

Students spent a total of 30 hours per week with the program for 10 weeks in summer and 10–20 hours per week during the school year. They participated in the research program via data handling and data processing with the aid of computer operated equipment, and in enrichment activities during the summer; including lectures, laboratory demonstrations, scientific films, field trips and a formal course and a weekly discussion session on the history of science using the book *Coming of Age in the Milky Way* by Timothy Ferris. A summary of their activities and projects is included in section 3.

2. STUDENTS' VITAE

NAME:	Christopher Conklin
RACE:	White
SEX:	Male
HIGH SCHOOL:	Lincoln High School
ANTICIPATED COLLEGE:	Still in High School (12th grade)
ANTICIPATED MAJOR:	Computer Programming
AWARDS/SCHOLARSHIPS:	Life Scout Order of the Arrow, Member of State Honor Band
ACTIVITIES/HOBBIES:	Computers, Scouting, Reading and Fantasy Games

NAME:	Tiffany Givens
RACE:	Black
SEX:	Female
HIGH SCHOOL:	FAMU Developmental Research School
ANTICIPATED COLLEGE:	Undecided
ANTICIPATED MAJOR:	Pharmacy
AWARDS/SCHOLARSHIPS:	Full Scholarship to FAMU, Chappie James Scholarship Award, SGA President (1994–1995) FAMU Developmental Research School
ACTIVITIES/HOBBIES:	SGA, Basketball Players and Statistics, Baseball Players and Statistics, Math and Science Club, 1st and 2nd Place Science Fair Winner

NAME:	Adrianne Holmes
RACE:	Black
SEX:	Female
HIGH SCHOOL:	Lincoln High School
ANTICIPATED COLLEGE:	Undecided
ANTICIPATED MAJOR:	Chemistry
AWARDS/SCHOLARSHIPS:	National Honor Society, Mu Alpha Theta, Who's Who Among High School Students, National History and Geography Award, First Place District History Fair (1995)
ACTIVITIES/HOBBIES:	Service Club, Youth Choir Member, SADD

NAME:	Julie Matthews
RACE:	White
SEX:	Female
HIGH SCHOOL:	Leon High School
ANTICIPATED COLLEGE:	University of Florida
ANTICIPATED MAJOR:	Sports Medicine
AWARDS/SCHOLARSHIPS:	Honor Roll
ACTIVITIES/HOBBIES:	Weightlifting, Swimming

NAME:	Matthew Nemethy
RACE:	White
SEX:	Male
HIGH SCHOOL:	Godby High School
ANTICIPATED COLLEGE:	Florida State University
ANTICIPATED MAJOR:	Environmental Engineering
AWARDS/SCHOLARSHIPS:	Who's Who of American High School Students, Commemorated National Merit Scholar, University Scholarship, Wal-Mart Scholarship, Florida Academic Scholarly Academic High School Scholar, High Honor Roll
ACTIVITIES/HOBBIES:	NME Participant, Second Place Team Chemathon, First Place Oratory Impromptu Speech Competition and Young Engineer of Florida

NAME:	Robert L. Outlaw
RACE:	White
SEX:	Male
HIGH SCHOOL:	Lincoln High School
ANTICIPATED COLLEGE:	Undecided
ANTICIPATED MAJOR:	Undecided
AWARDS/SCHOLARSHIPS:	Academic Achievement Award (9^{th}–11^{th} Grades), Mu Alpha Theta Individual and Team Accomplishments (9^{th}–11^{th} Grades), President of the Local Chapter of the Junior Classical League (12^{th} Grade), Numerous Academic Awards (11^{th}–12^{th} Grades)
ACTIVITIES/HOBBIES:	Board Games, Card Games, Walking, Free Writing

NAME:	Smitha R. Pabbathi
RACE:	Asian
SEX:	Female
HIGH SCHOOL:	Leon High School
ANTICIPATED COLLEGE:	Florida State University
ANTICIPATED MAJOR:	Engineering
AWARDS/SCHOLARSHIPS:	National Honor Society
ACTIVITIES/HOBBIES:	Anchor, Latin Club, MAΘ, National Honor Society, Drawing, Reading

NAME:	Vishnu Pabbathi
RACE:	Asian
SEX:	Male
HIGH SCHOOL:	Leon High School
ANTICIPATED COLLEGE:	Undecided
ANTICIPATED MAJOR:	Undecided
AWARDS/SCHOLARSHIPS:	
ACTIVITIES/HOBBIES:	Basketball, Running

NAME:	Lynn Proctor
RACE:	White
SEX:	Female
HIGH SCHOOL:	Leon High School
ANTICIPATED COLLEGE:	Dartmouth
ANTICIPATED MAJOR:	Undecided
AWARDS/SCHOLARSHIPS:	Ida Raa Myrick Physics Award, Mathmaster Award, NCTE Award for Excellence in Writing, Second Place State Latin, Second Place Pre-Calculus Team in Mu Alpha Theta, Gold Medal on National Latin Exam, Robert C. Byrd Scholarship
ACTIVITIES/HOBBIES:	Jogging, Tennis, Swimming, Art (2-D watercolors and drawings), Latin Club, Honor Society, Math Club, Science Clubs, Anchor (Girls' Service Club)

NAME:	Terra Sherlock
RACE:	White
SEX:	Female
HIGH SCHOOL:	Leon High School
ANTICIPATED COLLEGE:	Undecided
ANTICIPATED MAJOR:	Physics
AWARDS/SCHOLARSHIPS:	Golden Glove Award (soccer), Sheriff's Ride Along and Shooting Program Awards, 1st Place in 3rd Grade Science Fair
ACTIVITIES/HOBBIES:	1st Sergeant in the Sheriff's Explorers, Vice-President in Nice Science Club, Communications Officer of Phoenix Science Club, Junior Varsity and Varsity Soccer

NAME:	Benjamin Switzer
RACE:	White
SEX:	Male
HIGH SCHOOL:	Godby High School
ANTICIPATED COLLEGE:	Undecided
ANTICIPATED MAJOR:	Computer Science
AWARDS/SCHOLARSHIPS:	Honor Roll
ACTIVITIES/HOBBIES:	Martial Arts, Chess, Quotes Collector

NAME:	Michelle Wallace
RACE:	Black
SEX:	Female
HIGH SCHOOL:	Lincoln High School
ANTICIPATED COLLEGE:	University of Miami
ANTICIPATED MAJOR:	Biology
AWARDS/SCHOLARSHIPS:	National Honor Society, 1995 1st place Leon County History Fair, Biological Institute of ONR Math Award, Biological Institute of ONR Science Award
ACTIVITIES/HOBBIES:	Piano, Reading

3. STUDENT WORK PROJECTS AND INSTRUCTION

Ten of the students participated in digitizing velocity vector data from photographs of flow fields obtained in laboratory experiments that simulate the influence of mountains on the atmospheric jet stream, and two assisted in data analysis using computer programs on PCs and the VAX. These activities were part of a larger project on studies of the interaction of bottom topography with overlying baroclinic waves investigated by Drs. R. L. Pfeffer and R. Kung. The students' work was supervised by Mr. Eugene Arbogast.

The major project in which the students participated during the summer was the analysis of photographic velocity data from laboratory experiments on the interaction of topography with baroclinic waves, and flows with azimuthally varying lower thermal boundary conditions. The experiments were conducted in a thermally driven rotating annulus of fluid.

Oceanography Prof. Ruby Krishnamurti demonstrates vortex rings to the high school student group.

The data from the experiments were obtained by means of a camera, mounted at the top of a rotating annulus of fluid, which recorded the movements of laser-illuminated particles suspended in the fluid.

The camera produced a sequence of still photographs; in each photograph the movement of every particle appeared as a string of dots. By digitizing the positions of these dots and calculating the distance between dots and the orientation of each string of dots, one can determine the velocity field as a function of time. Fourier analyses and energetics calculations of such data provide valuable information about the behavior of baroclinic waves in the presence of bottom topography.

The students had the opportunity to gain experience in the use of digitizing equipment, personal computers, and video monitors which display the work graphically as it is being digitized. They were also able to see and discuss the results of a first-level analysis of the digitized data performed on the GFDI DEC VAX computer cluster. During the course of the summer, the students worked with the photographs from several different experiments, which allowed them to see effects of variations in experimental parameters such as the difference in temperature between the inner and outer walls of the bath, the speed of rotation, and the presence or absence of topography.

The instruction and training given to the high school students concerning their work as apprentices went well beyond that needed to do the job. Efforts were made by the faculty and staff to make their work experience a learning process and an introduction to scientific methodology. Our goal was to ensure the students' understanding of the relationships between theoretical models and observable phenomena, such as the jet stream and ocean currents, such as the Gulf Stream and Kuroshio Current, which affect the transfer of heat from the tropics to the arctic. This was accomplished by explaining in detail the goals of the program, the scientific methodology, the implications of the experimental and related theoretical results and the contributions of the students' work to the overall project.

4. ENRICHMENT ACTIVITIES

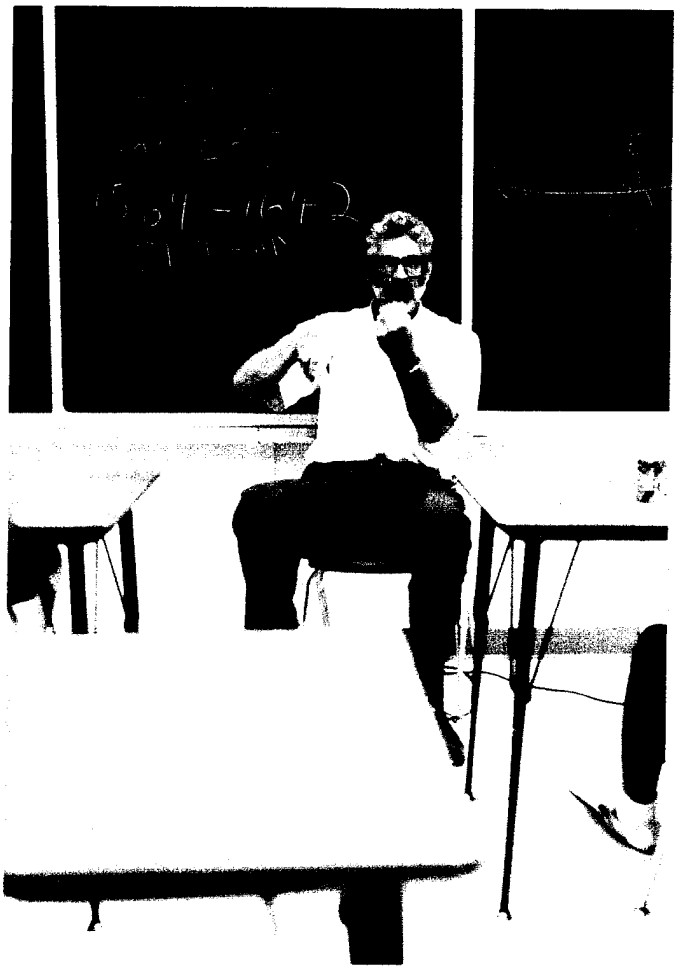
Aside from the students' activities as apprentices, they participated in a variety of other educational activities. These included a series of talks on research topics covering a broad spectrum of scientific disciplines. Talks were given by graduate student Scott Applequist and Drs. Blumsack, Cross, Furbish,

Gruender, Howard, Ruby Krishnamurti, Kung, Long, Loper, Pfeffer and Ruscher on topics ranging from the modeling of the Earth's Interior to Protein Structure. In addition, the students participated in discussions with Dr. Long on *Coming of Age in the Milky Way*, an exciting book on the history and methodology of physical science by Timothy Ferris. A series of scientific films was also selected and shown by Dr. Kung. These covered topics such as astronomy, the strange new science of deterministic chaos, space exploration, the oceans and others. Drs. Kung and Ruby Krishnamurti also engaged the students in a series of scientific experiments in which different natural phenomena were simulated in the laboratory. Gene Arbogast took the students on field trips to the National Magnet Lab, the FSU Planetarium, the local TV weather station, the U. S. Weather Service and the FSU Marine Lab. A list of these activities is given in Table 1.

Seven of the students also took advantage of another opportunity offered by the program — namely, a course of their choice, with tuition and books paid for by the program. Three of the students took a Psychology course, one took a Nutritional Science class, one a Math course and two of them took a Meteorology course. All of these courses were for college credit.

5. CONCLUSION

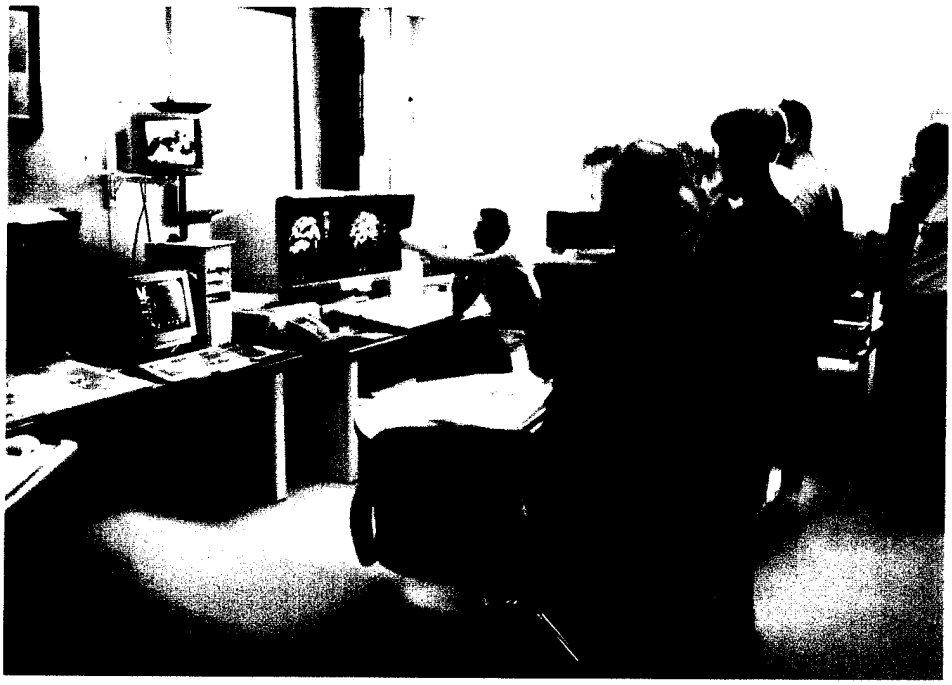
Questionnaires completed at the end of the summer program of enrichment activities revealed that the students felt that, aside from the monetary rewards, they had benefited a great deal from both the hands on work experience and the enrichment program. This was especially true of the younger students. They were grateful for the opportunity to work in a scientific environment and acquire new skills and experience. Faculty and staff mentors reported that the students were bright, attentive, well motivated and willing to work. Their contribution to the various projects was also significant. The digitizing work was done carefully and accurately and hence contributed substantially to a much needed data base for further analysis and study.

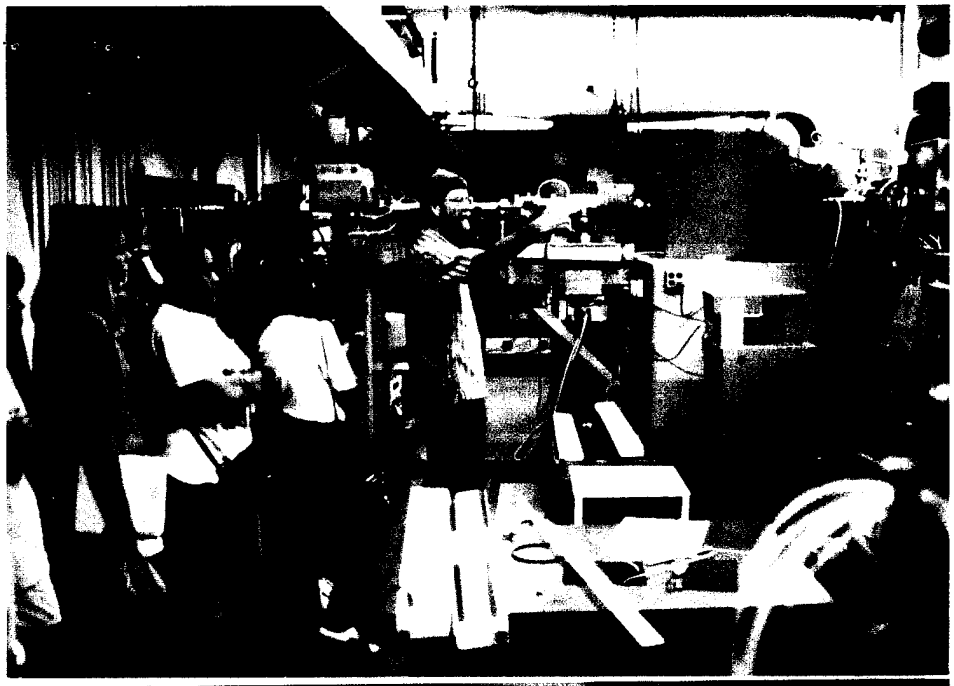


Philosophy Professor David Gruender discusses the life and scientific accomplishments of Galileo with the high school students.

In general, the students felt financially rewarded and scientifically enriched by their experience in the program. We feel that the students acquired a certain maturity and confidence which should be a great asset to them during their final years in high school, college and their chosen careers.

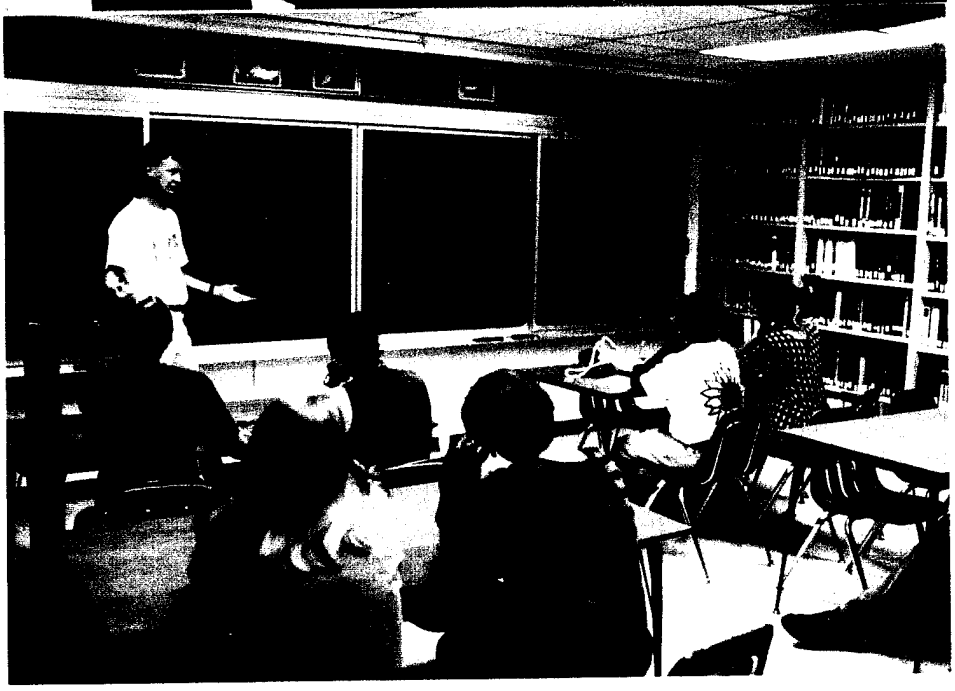
A trip to the National Weather Service Operations at the Tallahassee Airport.





Dr. Long tells the high school students about current research at the FSU Nuclear Physics Laboratory.

Dr. Kung shows the students how experimental data are taken.



Graduate student Scott Applequist explains statistical weather prediction.

1995 ONR/GFDI Summer Enrichment Program Schedule

Time: 2:00 PM to 3:00 PM; Place: GFDI Reading Room or as indicated

Monday *Films*	Tuesday *Lab. Demonstrations*	Wednesday *Talks*	Thursday *Discussions***
June 5 (V70492) ***The Shores of the Cosmic Ocean*** (COSMOS Episode 1)	6 **Dr. Robin Kung** *Laboratory Experiments at GFDI*	7 **Prof. Louis Howard** *Semi-Regular Polyhedra*	8 **Dr. Christopher Long** *The Dome of Heaven & Raising the Roof*
12 (V70494) ***The Traveler's Tales*** (COSMOS Episode 6)	13 **Dr. Ruby Krishnamurti** *Rayleigh-Benard Convection*	14 **Prof. Steven Blumsack** *Conjectures of Mathematics*	15 **Dr. Christopher Long** *The Discovery of the Earth*
19 (V70495) ***Travels in Space and Time*** (COSMOS Episode 8)	20 **Dr. Robin Kung** *Annulus Experiments*	21 **Prof. David Loper** *The Earth's Interior*	22 **Dr. Christopher Long** *The Sun Worshippers*
26 (V70498) ***Who Speaks for Earth*** (COSMOS 13)	27 **Dr. Ruby Krishnamurti** *Thermal Oscillators*	28 **Prof. Richard Pfeffer** *Simulating the Jet Stream in the Laboratory*	29 **Dr. Christopher Long** *The World in Retrograde*
July 3 (V70941) ***Inside Creativity*** (Creative Spirit 1)	4 **Holiday**	5 **Mr. Scott Applequist** *Statistical Weather Prediction*	6 **Dr. Christopher Long** *Newton's Reach*
10 (V70306) ***Strange New Science of Chaos*** (NOVA)	11 **Dr. George Buzyna** (at M. E. Lab.) *Supersonic Flow*	12 **Prof. Paul Ruscher** *Weather Forecasting*	13 **Dr. Christopher Long** *A Plumb Line to the Sun*
17 (F382460) ***Distant Voices*** (Connection 3)	18 **Dr. Ruby Krishnamurti** *Double-Diffusive Instability*	19 **Prof. David Furbish** *Dynamics of River Meanders*	20 **Dr. Christopher Long** *Deep Space*
24 (F382470) ***Faith in Numbers*** (Connection 4)	25 **Dr. Robin Kung** *Rotating Fluid Flows*	26 **Prof. David Gruender** *Galileo and How the World Turns*	27 **Dr. Christopher Long** *Island Universes*
31 (F382510) ***Eat, Drink and Be Merry*** (Connection 8)	August 1 **Dr. Ruby Krishnamurti** *Mixing and Unmixing*	2 **Prof. David Furbish** *Bubble Dynamics and Volcanic Eruptions*	3 **Dr. Christopher Long** *Einstein's Sky*
7 (F382530) ***Yesterday, Tomorrow, and You*** (Connection 10)	8 **Dr. Robin Kung** *Temperature Calibrations*	9 **Prof. Timothy Cross** *Protein Structure*	10 **Dr. Christopher Long** *The Expansion of the Universe*

** Chapter by chapter discussion of "*Coming of Age in the Milky Way*" by Timothy Ferris, Anchor Books, 1988.

(Suggested Form)

INFORMATION FOR EACH APPRENTICE

1. Name: Conklin (last) Christopher (first)

2. [redacted]

PII Redacted

3. School Address, 19 95, if applicable Lincoln (name) (904) 487-2110 (phone)
3838 Trojan Trail, Tallahassee, FL

4. Expected Major/University Enrolled in: Computer Programming

5. Last Grade Completed 10 Type of School: (X)Public ( )Private

6. Race/Ethnicity: (Voluntary) ( )Black ( )White ( )Hispanic ( )Asian ( )Other

7. Sex: (X)Male ( )Female WGPA: 3.2

8. Installation Geophysical Fluid Dynamics Institute, Florida State University (name)

9. Mentor(s): Dr. Robin J. Kung, Associate Scholar/Scientist
Dr. Richard L. Pfeffer, Professor of Meteorology and GFDI Associate
(name) (title)

10. Principal Discipline of Research: Atmospheric Sciences

11. Major Tasks Performed: Digitizing of velocity vectors from photographs of flow fields obtained in laboratory experiments.

12. Honors, Awards and Scholarships: Life Scout, Order of the Arrow
Member of the State Honor Band

13. Activities/Hobbies: Computers, scouting, reading and fantasy fames.

(Suggested Form)

INFORMATION FOR EACH APPRENTICE

1. Name: Givens (last) Tiffany (first)

2. [redacted]

PII Redacted

3. School Address, 19 95, if applicable FAMU High (name) . (904)599-3325 (phone)

4. Expected Major/University Enrolled in: Pharmacy

5. Last Grade Completed 12 Type of School: ( )Public (X)Private

6. Race/Ethnicity: (Voluntary) (X)Black ( )White ( )Hispanic ( )Asian ( )Other

7. Sex: ( )Male (X)Female WGPA: _____

8. Installation Geophysical Fluid Dynamics Institute, Florida State University (name)

9. Mentor(s): Dr. Robin J. Kung, Associate Scholar/Scientist
Dr. Richard L. Pfeffer, Professor of Meteorology and GFDI Associate
(name) (title)

10. Principal Discipline of Research: Atmospheric Science

11. Major Tasks Performed: Digitizing of velocity vectors from photographs of flow fields obtained in laboratory experiments.

12. Honors, Awards and Scholarships: Full Scholarship to FAMU Chappie James Scholarship Award, SGA President (1994'95) FAMU DRS, etc.

13. Activities/Hobbies: SGA, Basketball (player & Stats), Baseball (Stats), Math & Science Club, 1st & 2nd Place Science Fair Winnter, etc.

(Suggested Form)

INFORMATION FOR EACH APPRENTICE

1. Name: Holmes (last) Adrianne (first)

2. [redacted]

PII Redacted

3. School Address, 19 95-'96, if applicable Lincoln High (name) (904) 487-2110 (phone)
3838 Trojan Trail, Tallahassee, FL 32311

4. Expected Major/University Enrolled in: Chemistry

5. Last Grade Completed 11 Type of School: (X)Public ( )Private

6. Race/Ethnicity: (Voluntary) (X)Black ( )White ( )Hispanic ( )Asian ( )Other

7. Sex: ( )Male (X)Female WGPA: 3.93

8. Installation Geophysical Fluid Dynamics Institute, Florida State University (name)

9. Mentor(s): Dr. Robin J. Kung, Associate Scholar/Scientist
Dr. Richard L. Pfeffer, Professor of Meteorology and GFDI Associate (name, title)

10. Principal Discipline of Research: Atmospheric Science

11. Major Tasks Performed: Digitizing of velocity vectors from photographs of flow fields obtained in laboratory experiments.

12. Honors, Awards and Scholarships: National Honor Society, Mu Alpha Theta, Who's Who Among High School Students, National History and Geography Award, First Place Distinct History Fair (1995).

13. Activities/Hobbies: Service Club, Youth Choir Member, SADD.

(Suggested Form)

INFORMATION FOR EACH APPRENTICE

1. Name: Matthews (last) Julie (first)

2. [redacted]

PII Redacted

3. School Address, 19 95, if applicable Leon High (name) (904)488-1971 (phone)
500 Tennessee St.,Tallahassee, Fl

4. Expected Major/University Enrolled in: Sports Medicine/Univ. of Florida

5. Last Grade Completed 11 Type of School: (X)Public ( )Private

6. Race/Ethnicity: (Voluntary) ( )Black (X)White ( )Hispanic ( )Asian ( )Other

7. Sex: ( )Male (X)Female WGPA: 4.0

8. Installation Geophysical Fluid Dynamics Institute, Florida State University (name)

9. Mentor(s): Dr. Robin J. Kung, Associate Scholar/Scientist
Dr. Richard L. Pfeffer, Professor of Meteorology and GFDI Associate
(name) (title)

10. Principal Discipline of Research: Atmospheric Science

11. Major Tasks Performed: Digitizing of velocity vectors from photographs of flow fields obtained in laboratory experiments.

12. Honors, Awards and Scholarships: Honor Roll

13. Activities/Hobbies: Weightlifting, Swimming

(Suggested Form)

INFORMATION FOR EACH APPRENTICE

1. Name: Nemethy (last) Matthew (first)

2. [redacted]

PII Redacted

3. School Address, 1994-'95, if applicable Godby (name) (904) 488-1325 (phone)
1717 W. Tharpe St., Tallahassee, FL

4. Expected Major/University Enrolled in: Environmental Engineering/FSU

5. Last Grade Completed 12 Type of School: (X)Public ( )Private

6. Race/Ethnicity: (Voluntary) ( )Black (X)White ( )Hispanic ( )Asian ( )Other

7. Sex: (x)Male ( )Female WGPA: 4.04

8. Installation Geophysical Fluid Dynamics Institute, Florida State University (name)

9. Mentor(s): Dr. Robin J. Kung, Associate Scholar/Scientist
Dr. Richard L. Pfeffer, Professor of Meteorology and GFDI Associate
(name) (title)

10. Principal Discipline of Research: Atmospheric Science

11. Major Tasks Performed: Digitizing of velocity vectors from photographs of flow fields obtained in laboratory experiments.

12. Honors, Awards and Scholarships: Who's Who Among American Highschool Students; Commerated National Merit Scholar; University Scholarship; Walmart Scholarship Recipiant; Florida Academic Scholarship; Academic High School Scholar; High Honor Roll; NME participant; Second Place Team Chemathon, First Place Oratory/Impromptu Speech Competition and Young Engineer of Florida.

13. Activities/Hobbies:

(Suggested Form)

INFORMATION FOR EACH APPRENTICE

1. Name: Outlaw (last) Robert (first) L.

2. [redacted]

PII Redacted

3. School Address, 19 95, if applicable Lincoln High (name) (904) 487-2110 (phone)
3838 Trojan Trail, Tallahassee, FL

4. Expected Major/University Enrolled in: Undecided

5. Last Grade Completed 11 Type of School: (X)Public ( )Private

6. Race/Ethnicity: (Voluntary) ( )Black (X)White ( )Hispanic ( )Asian ( )Other

7. Sex: (X)Male ( )Female WGPA: 4.3

8. Installation Geophysical Fluid Dynamics Institute, Florida State University (name)

9. Mentor(s): Dr. Robin J. Kung, Associate Scholar/Scientist
Dr. Richard L. Pfeffer, Professor of Meteorology and GFDI Associate (name / title)

10. Principal Discipline of Research: Atmospheric Science

11. Major Tasks Performed: Digitizing of velocity vectors from photographs of flow fields obtained in laboratory experiments.

12. Honors, Awards and Scholarships: Academic Achievement Award, 9-11, Mu Alpha Theta 9-12 (Individual and team accomplishments),JCL (Junior Classical League), President Local Chapter (12), numerous academic awards, Academic Team 11-12.

13. Activities/Hobbies: Board games, card games, walking, free writing.

(Suggested Form)

INFORMATION FOR EACH APPRENTICE

1. Name: Pabbathi (last) Smitha (first) R.

2. [redacted]

PII Redacted

3. School Address, 1994-'95, if applicable Leon High, (904)488-1971
name phone
W. Tennessee Street, Tallahassee FL

4. Expected Major/University Enrolled in: Engineering/FSU

5. Last Grade Completed 12 Type of School: (x)Public ( )Private

6. Race/Ethnicity: (Voluntary) ( )Black ( )White ( )Hispanic (x)Asian ( )Other

7. Sex: ( )Male (x)Female WGPA: 4.28

8. Installation Geophysical Fluid Dynamics Inst., FSU, Tallahassee, FL 32306
name

9. Mentor(s): Dr. Robin Kung, Associate Scholar/Scientist
Dr. Richard L. Pfeffer, Professor of Meteorology and GFDI Associate
name title

10. Principal Discipline of Research: Atmospheric Science

11. Major Tasks Performed: Digitizing of velocity vectors from photographs of flow fields obtained in laboratory experiments.

12. Honors, Awards and Scholarships: National Honor Society

13. Activities/Hobbies: Anchor, Latin Club, MAE, National Honor Society, enjoy drawing and reading.

(Suggested Form)

INFORMATION FOR EACH APPRENTICE

1. Name: Pabbathi (last) Vishnu (first)

2. [redacted]

PII Redacted

3. School Address, 19 95-'96, if applicable Leon High (name) (904) 488-1971 (phone)
500 Tennessee Street, Tallahassee, FL

4. Expected Major/University Enrolled in: Undecided

5. Last Grade Completed 9 Type of School: (X)Public ( )Private

6. Race/Ethnicity: (Voluntary) ( )Black ( )White ( )Hispanic (X)Asian ( )Other

7. Sex: (X)Male ( )Female WGPA: 3.71

8. Installation Geophysical Fluid Dynamics Institute, Florida State University (name)

9. Mentor(s): Dr. Robin J. Kung, Associate Scholar/Scientist
Dr. Richard L. Pfeffer, Prpfessor of Meteorology and GFDI Associate
(name) (title)

10. Principal Discipline of Research: Atmospheric Science

11. Major Tasks Performed: Working on the computer and printing out plots of the laboratory experiments

12. Honors, Awards and Scholarships:

13. Activities/Hobbies: Playing Basketball, running.

(Suggested Form)

INFORMATION FOR EACH APPRENTICE

1. Name: Proctor (last) Lynn (first)

2. [redacted]

PII Redacted

3. School Address, 19 95-96, if applicable Leon High (name) (904) 488-1971 (phone)
550 Tennessee St., Tallahassee, FL

4. Expected Major/University Enrolled in: Undecided/Dartmouth, NH

5. Last Grade Completed 12 Type of School: (X)Public ( )Private

6. Race/Ethnicity: (Voluntary) ( )Black (X)White ( )Hispanic ( )Asian ( )Other

7. Sex: ( )Male (X)Female WGPA: 4.8

8. Installation Geophysical Fluid Dynamics Institute, Florida State University (name)

9. Mentor(s): Dr. Robin J. Kung, Associate Scholar/Scientist
Dr. Richard L. Pfeffer, Professor of Meteorology and GFDI Associate
(name) (title)

10. Principal Discipline of Research: Atmospheric Sciences

11. Major Tasks Performed: Digitizing of velocity vectors form photographs of flow fields obtained in laboratory experiments.

12. Honors, Awards and Scholarships: Ida Raa Myrick Physics Award, Mathmaster Award, NCTE Award for Excellence in Writing, Second place State Latin, Second place Pre-Calc team in the Alpha Theta, Gold Medal on Nat.Latin Exam, Robert C. Byrd Scholarship.

13. Activities/Hobbies: Jogging, Tennis, Swimming, Art (2-D watercolors & drawings), Latin Club, Honor Society, Math Club, Science Clubs, Anchor (Girls' Service Club).

(Suggested Form)

INFORMATION FOR EACH APPRENTICE

1. Name: Sherlock (last) Terra (first)

2. [redacted]

PII Redacted

3. School Address, 19 95-'96, if applicable Leon High (name) (904) 488-1971 (phone)
500 Tennessee Street, Tallahassee, FL

4. Expected Major/University Enrolled in: Physics

5. Last Grade Completed 11 Type of School: (X)Public ( )Private

6. Race/Ethnicity: (Voluntary) ( )Black (X)White ( )Hispanic ( )Asian ( )Other

7. Sex: ( )Male (X)Female WGPA: _____

8. Installation Geophysical Fluid Dynamics Institute, Florida State University (name)

9. Mentor(s): Dr. Robin J. Kung, Associate Scholar/Scientist
Dr. Richard L. Pfeffer, Professor of Meteorology and GFDI Associate
(name) (title)

10. Principal Discipline of Research: Atmospheric Sciences

11. Major Tasks Performed: Digitizing of velocity vectors from photographs of flow fields obtained in laboratory experiments.

12. Honors, Awards and Scholarships: Golden Glove Award (Soccer), Sheriff's Ride Along and Shooting Program Awards, 1st Place in 3rd grade Science Fair.

13. Activities/Hobbies: 1st Seargent in the Sheriff's Explorers, Vice-President in Nice Science Club, Communication Officer of Phoenix Science Club, Junior Varsity and Varsity Soccer.

(Suggested Form)

INFORMATION FOR EACH APPRENTICE

1. Name: Switzer (last) Benjamin (first)

2. [redacted]

PII Redacted

3. School Address, 19 95, if applicable Godby (name) (904) 488-1325 (phone)
1717 W. Tharpe St., Tallahassee, FL

4. Expected Major/University Enrolled in: Undecided

5. Last Grade Completed 11 Type of School: (X)Public ( )Private

6. Race/Ethnicity: (Voluntary) ( )Black (X)White ( )Hispanic ( )Asian ( )Other

7. Sex: (X)Male ( )Female WGPA: 3.7

8. Installation Geophysical Fluid Dynamics Institute, Florida State University (name)

9. Mentor(s): Dr. Robin J. Kung, Associate Scholar/Scientist
Dr. Richard L. Pfeffer, Professor of Meteorology and GFDI Associate
(name) (title)

10. Principal Discipline of Research: Atmospheric Science

11. Major Tasks Performed: Computer maintenance

12. Honors, Awards and Scholarships: Honor Roll

13. Activities/Hobbies: Martial Arts, Chess and quotes collector

(Suggested Form)

INFORMATION FOR EACH APPRENTICE

1. Name: Wallace (last) Michelle (first)

2. [redacted] PII Redacted

3. School Address, 19 95, if applicable Lincoln High (904)487-2110
(name) (phone)
3838 Trojan Trail, Tallahassee, FL

4. Expected Major/University Enrolled in: Biology - University of Miami, FL

5. Last Grade Completed 11 Type of School: (X)Public ( )Private

6. Race/Ethnicity: (Voluntary) ( )Black ( )White ( )Hispanic ( )Asian ( )Other

7. Sex: ( )Male (X)Female WGPA: 4.46

8. Installation Geophysical Fluid Dynamics Institute
(name)

9. Mentor(s): Dr. Robin J. Kung, Associate Scholar/Scientist
Dr. Richard L. Pfeffer, Professor of Meteorolgy and GFDI Associate
(name) (title)

10. Principal Discipline of Research: Atmospheric Sciences

11. Major Tasks Performed: Digitizing of velocity vectors from photographs of flow fields obtianed in laboratory experiments.

12. Honors, Awards and Scholarships: National Honor Society
1995 Ist place Leon county history fair, Biological Institute of ONR Math Award, Biological Institute of ONR Science Award.

13. Activities/Hobbies: Piano, Reading

INFORMATION FOR EACH MENTOR

1 NAME Arbogast (last) Eugene (first)

2 INSTALLATION Florida State University, Geophysical Fluid Dynamics Institute (name)

(904) 644-5594 (phone)

3 [redacted]

PII Redacted

4 SEX ( )FEMALE (X)MALE

5 RACE/ETHNICITY: (Voluntary) ( )Black (XX)White ( )Hispanic ( )Asian ( )Other

6 HIGHEST DEGREE EARNED Highschool Diploma

7 PRINCIPAL FIELD OF RESEARCH Geophysical Fluid Dynamics

8 NUMBER OF YEARS OF MENTORSHIP 2

9 NUMBER OF APPRENTICES SUPERVISED THIS YEAR, 95 12

INFORMATION FOR EACH MENTOR

1 NAME Kung (last) Robin (first)

2 INSTALLATION FLorida State University, Geophysical Fluid Dynamics Institute (name)

(904) 644-5594 (phone)

3 [redacted]

PII Redacted

4 SEX ( )FEMALE (X)MALE

5 RACE/ETHNICITY: (Voluntary) ( )Black ( )White ( )Hispanic (x)Asian ( )Other

6 HIGHEST DEGREE EARNED Ph. D.

7 PRINCIPAL FIELD OF RESEARCH Geophysical Fluids Dynamics

8 NUMBER OF YEARS OF MENTORSHIP 11

9 NUMBER OF APPRENTICES SUPERVISED THIS YEAR, 1995 12

INFORMATION FOR EACH MENTOR

1. Name: Long (last) Christopher (first)

2. Installation: Florida State University, Geophysical Fluid Dynamics Institute (name)

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3. [redacted]

PII Redacted

4. Sex ( ) Female (x) Male

5. Race/Ethnicity: (Voluntary) ( )Black (x)White ( )Hispanic ( )Asian ( )Other

6. Highest Degree Earned: Ph.D.

7. Principal Field of Research: Atmospheric Sciences

8. Number of Years of Mentorship: 2

9. Number of Apprentices Supervised this Year, 1995 : 8

INFORMATION FOR EACH MENTOR

1. Name: Pfeffer (last) Richard L. (first)

2. Installation: Florida State University, Geophysical Fluid Dynamics Institute (name)

(904) 644-5594 (phone)

3. [redacted]

PII Redacted

4. Sex ( ) Female (x) Male

5. Race/Ethnicity: (Voluntary) ( )Black (x)White ( )Hispanic ( )Asian ( )Other

6. Highest Degree Earned: Ph.D.

7. Principal Field of Research: Meteorology and Geophysical Fluid Dynamics

8. Number of Years of Mentorship: 13

9. Number of Apprentices Supervised this Year, 1995 : 12

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13. ABSTRACT (Maximum 200 words)

In the spring of 1995 the guidance counselors of five local high schools were asked to recommend outstanding college-bound students who they thought would benefit most from our program. Eight students were selected to participate starting in the summer of 1995 and nine during the school year, five of whom were from the summer program and 2 of whom were from last year's program. Our student group consisted of four seniors, six juniors and two exceptional sophomores. The departure from our past concentration on seniors was motivated by our desire to expose students to science and scientific methodology at an earlier age. This report contains background information concerning the students who were selected.

Students spent a total of 30 hours per week with the program for 10 weeks in summer and 10-20 hours pwer week during the school year. They participated in theresearch program via data handling and data processing with the aid of computer operated equipment, and in enrichment activities during the summer; including lectures, laboratory demonstrations, scientific films, a formal course and a weekly discussion session on the history of science using the book COMING OF AGE IN THE MILKY WAY by Timothy Ferris.

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